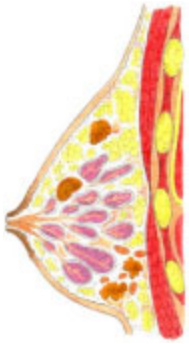
X-Plain™
Breast Cancer
Reference Summary

Cancer of the breast is the most common form of cancer that affects women.
About 1 in 8 women in the United States will develop breast cancer during her lifetime.
This reference summary will help you understand the diagnosis and treatment options of breast cancer.

Cancer And Its Causes

The body is made up of very small cells.
Normal cells in the body grow and die in a controlled way.
Sometimes cells keep dividing and growing without normal controls, causing an abnormal growth called a tumor.
If the tumor does not invade nearby tissues and body parts, it is called a benign tumor, or non-cancerous growth. Benign tumors are rarely life threatening.
If the tumor invades and destroys nearby cells, it is called a malignant tumor, or cancer. Cancer can sometimes be life threatening.
Cancerous cells may also spread to different parts of the body through blood vessels and lymph channels.
Lymph is a nearly clear fluid produced by the body that drains waste from cells. It travels through special vessels and bean-shaped structures called lymph nodes.
Cancer treatments are used to kill or control abnormally growing cancerous cells.
Cancers in the body are given names, depending on where the cancer started. Cancer that begins in the breasts will always be called a breast cancer, even if it has spread to another place such as the liver, bones, or brain.
Although doctors can locate where a cancer started, the cause of a cancer in a patient cannot usually be identified.
Cells contain hereditary or genetic materials called chromosomes. This genetic material controls the growth of the cell.
Cancer always arises from changes that occur in these genetic materials. When the genetic material in a cell becomes abnormal, it can lose its ability to control its growth.
These sudden changes in genetic material can occur for a variety of reasons. These changes may be inherited from parents. Changes in genetic materials may also occur because of exposure to infections, drugs, tobacco, chemicals, or other factors.



Breast Anatomy

The breasts contain fatty tissue and glands.
The glands are responsible for making milk after a pregnancy.
They are responsive to many of the female hormones, such as estrogen and progesterone.

The milk is then secreted to the outside through special ducts that open up in the nipple.
The lymphatic system normally drains excess breast fluid into the lymph nodes in the axilla or armpit. From there, it goes back into the blood stream. The breasts lie over important muscles that allow the movement of the arm, as well as muscles involved in breathing.

Breast Cancer

Breast cancer may originate from either the glands or the ducts of the breast.
If cancer originates from the glands, it is called lobular carcinoma. The lobules are the special milk-producing glands.
When cancer occurs in the ducts of the breast it is known as ductal carcinoma.
When the cancer extends beyond its immediate surroundings, it is known as "infiltrating" or "invasive" cancer.
Cancer that has not crossed beyond the involved lobule or tubule is very limited in nature and is called "in-situ" carcinoma.
Breast cancer may involve more than one member of a family; this is usually called familial breast cancer. There might be some hereditary and genetic cause for this type of breast cancer. Recent genetic advances have allowed the detection of some of these genes.
Women with familial breast cancer can definitely benefit from genetic counseling and possibly genetic testing.

Signs and Symptoms

Early cancer of the breast usually has no symptoms.
Later, as the cancer grows, it may cause a lump that can be felt in the breast.
Sometimes the skin overlying the tumor becomes coarse and wrinkled. This is known as "peau d'orange" in French or "orange skin."
Discharge from the nipple can also be a sign of breast cancer.
Most breast cancer cases are discovered either by self-exam or a mammogram.

Diagnosis

When breast cancer has been detected, an operation to take the tumor out and to diagnose the cancer usually follows.
During such an operation, the surgeon may check the lymph nodes in the axilla for the presence of cancer. A pathologist looks at the tissue taken out at the time of surgery and determines whether or not the tumor is cancerous.
If the lump is cancerous, other more specialized pathological tests may be done on the tissue.
Your surgeon and oncologist may also ask you to have more radiological tests.
Some of the pathological tests can determine how much faster the cancer cells are multiplying than normal breast cells. Other pathological tests will determine whether the cancer cells are under the influence of normal female hormones such as estrogen and progesterone; this is known as the estrogen progesterone receptor test.
Radiological tests may include a bone scan and different CAT scans to check whether the cancer has spread outside the breast and the axilla area.

Staging

A stage is an indication of how widely spread the cancer is.
Staging involves a surgical procedure to determine the type of cancer and whether it has spread to the lymph nodes.
Treatment can be recommended based on the stage of the cancer.
Stages are usually described using the numbers 0 - 4; a lower number indicates an earlier stage of cancer.
Some stages may be divided into sub-stages. These sub-stages are given a letter designation. For example there is a stage 3A and a stage 3B. A stage 3B is more advanced than a stage 3A.

Stage 0 breast cancer is a carcinoma in-situ. When it originates from a lobule it is known as Lobular Carcinoma In Situ or LCIS. When it originates in a tubule it is known as Tubular Carcinoma In Situ or TCIS.

Stage 1 breast cancer measures less than 1 inch in size and has not spread outside of the breast.

Stage 2 breast cancer can be one of the following:

- Less than an inch in size and has spread to the lymph nodes in the axilla:
- 1 to 2 inches in size and may or may not have spread to the lymph nodes in the axilla
- 2 inches in size and has not spread to the lymph nodes in the axilla.

Stage 3A breast cancer can be one of the following:

- Less than 2 inches with spread to the lymph node of the axilla, which are attached to each others or other structures
- Larger than 2 inches with spread to the lymph nodes of the axilla

Stage 3B breast cancer can be one of the following:

- The cancer involves the skin or the chest wall;
- The cancer has spread to lymph nodes on the inside of the chest along the breastbone.

Stage 4 breast cancer has spread to other organs such as the bones, liver, brain, or lymph nodes in the neck or collarbone area.

Surgery

Most breast cancers are taken out surgically. The extent of the operation depends on the size of the tumor and whether or not the lymph nodes in the axilla are involved.

Breast cancer operations have two main goals. The first is to take the whole tumor out without leaving any tumor behind in the breast area.
The second goal is to check the lymph nodes of the axilla to make sure that the tumor has not spread to them. If it has spread to the lymph nodes, the surgeon may want to determine how many lymph nodes are involved with the tumor.
Since taking a lot of axilla lymph nodes out surgically can lead to swelling of the arm, known as lymphedema, new techniques are being developed to take out only a few important lymph nodes.
Several hours before the surgery, the surgeon injects either a special blue dye or a safe radioactive dye close to the tumor.
During the surgery, the surgeon takes the cancer out and is able to find the lymph nodes that have picked up the dye. The first lymph node to pick up the dye is known as the "sentinel node."
A lumpectomy is an operation aimed at taking only the cancerous lump, with some biopsies of the lymph nodes of the axilla. Radiation therapy is usually given after this type of operation.
A partial or segmental mastectomy takes more of the breast than a lumpectomy. Part of the covering of the underlying muscle may also be taken out. Radiation therapy is also usually needed after this type of operation. Again, some of the lymph nodes are taken out to check for any spread of the cancer.
A total or simple mastectomy aims at taking the whole breast out, along with some of the lymph nodes in the axilla.
A modified radical mastectomy aims at removing the breast, some of the underlying covering of the muscles, and possibly part of the muscle. Some of the lymph nodes of the axilla are also taken out during this type of operation.
A radical mastectomy aims at removing the breast, the underlying muscles and all of the lymph nodes of the axilla; this operation is rarely done.

Additional Treatment

After surgery, your doctor may recommend one or more types of therapies to help prevent the cancer from coming back. Common follow-up therapies include radiation therapy, hormonal therapy, and chemotherapy.
Radiation therapy is a series of x-ray treatments that are intended to free the breast or lymph nodes of any cancer cells that might still be present. It usually takes about 5 to 6 weeks of brief treatments to complete. Radiation therapy is usually given:

- After a lumpectomy
- After a mastectomy if the tumor was larger than 2 inches
- If a high number of involved lymph nodes were found
- If the tumor was close to the chest wall muscles or rib cage.

Hormonal therapy and chemotherapy are medications that may be recommended after surgery to help prevent the cancer from coming back. They may be given through an IV into the bloodstream or orally. Hormonal therapy is usually given if the cancer was found to have estrogen and or progesterone receptors. The presence of these receptors generally means that these hormones promote the growth of the cancer.

Hormone therapy with Tamoxifen or similar drugs can block the effect of progesterone and estrogen. It may be recommended that pre-menopausal women have their ovaries removed so that they stop producing estrogen and progesterone after breast cancer surgery.
Chemotherapy is usually given in cases where the breast tumor was very large or it had already spread to other organs of the body. Sometimes chemotherapy is given to decrease the risk of recurrence even if the cancer has not spread beyond the breast. There are many different situations where chemotherapy may be recommended. Your oncologist can discuss the possibilities with you and what he or she thinks is the most appropriate option for you.
Clinical trials are another means of treatment that are usually available; they are a way to test new treatment options. These trials are usually thought to be at least as effective as the best available treatment. They may be a combination of all the above-mentioned treatments.

After The Diagnosis

After the diagnosis of breast cancer it is normal for most patients to worry about the prospects and effects of treatment options such as surgery and chemotherapy. Fortunately, there are several options available to help patients look and feel their best. Plastic surgery and prostheses are available to make the change in the patient's appearance as unnoticeable as possible.
In some cases, chemotherapy can lead to temporary loss of hair. Excellent wigs are available; choosing one that matches your hair and hairstyle ahead of time is an excellent idea.
There are very helpful networks of patient support groups with people who have all experienced similar procedures. Breast cancer survivors in support groups and patient networks are glad to share their experiences and support. It is often a positive step toward recovery to join a support group and meet people who can understand your feelings.

Summary

Breast cancer is one of the more common cancers.
Early detection improves the overall cure rate and survival.
Regular breast self-exams and mammograms are very important.

Treatment options, including breast-sparing surgery, are now available.
The outlook for women with breast cancer is now better than it has ever been.